

IN THE CLAIMS

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1. An aerial-image display for viewing by an observer comprising:
a housing, including a window;
said housing including a first region for mounting an image source;
means for directing the image from said image source through said window for generating and viewing an aerial-image of said image in the area outside of said housing; and
polarizing means for preventing the viewing of a reflection of the observer in said window.
2. An aerial-image display in accordance with claim 1 wherein said directing means comprises a concave mirror positioned in said housing, exposed to the image from said source and to said window for directing an aerial-image through said window for viewing.
3. An aerial-image display in accordance with claim 1 wherein said polarizing means comprises a circularly polarized filter.

4. An aerial-image display in accordance with claim 3 wherein said circularly polarized filter is positioned in said window.

5. An aerial-image display in accordance with claim 1 including partially reflective means positioned in the image path between said image source and said directing means and between said reflective means for reflecting a portion of the light from said image source to said reflecting means and for transmitting the reflected image from said reflecting means through said window.

6. An aerial-image display in accordance with claim 5 wherein said partially reflective means is positioned at approximately a 45-degree angle with respect to said image source and said reflecting means.

7. An aerial-image display in accordance with claim 1 wherein said reflecting means is focused and positioned in said housing with its focus at a predetermined distance beyond said window, whereby an aerial-image of the image from said source is viewable as appearing outside of said housing at said predetermined distance from said housing window.

8. An aerial display in accordance with claim 7 wherein said partially reflective means is positioned at approximately a 45-degree angle with respect to said window.

9. An aerial-image display in accordance with claim 1 wherein said image source is a video display.

10. An aerial display in accordance with claim 9 wherein said image source is a cathode ray tube display.

11. An aerial display in accordance with claim 9 wherein said image source is a liquid crystal display.

12. An aerial-image display in accordance with claim 1 wherein said image source is an actual object to be displayed as an aerial-image outside of said housing.

13. An aerial-image display in accordance with claim 1 including means for illuminating said object.

14. An aerial-image display in accordance with claim 13 wherein said illuminating means includes at least one lamp in said second region of said housing interior directed at said object.

15. An aerial-image display in accordance with claim 13 including means for rotating said object whereby the aerial-image of said object similarly rotates.

16. An aerial-image display in accordance with claim 1 wherein said housing is a clock enclosure and a clock including a display of time, wherein said display of time constitutes the image source.

17. An aerial-image display in accordance with claim 16 wherein said display of time includes a face with hour indicators thereon and hands;

wherein said face and hour indicators appear stationary in said aerial display and the hands appear to move in space as in the clock which constitutes the image source.

18. An aerial-image display in accordance with claim 1 wherein said display produces an aerial-image at a predetermined distance from the window of said housing;

said housing further including a platform including portions thereof at said predetermined distance from said window outside of said housing whereby aerial-images produced by said display appear to be resting on said platform and available for closeup examination by the observer and attempts to touch the aerial-image.

19. An aerial-image display in accordance with claim 1 wherein said reflecting means comprises a partial spherical concave mirror having a front face and a rear face; and

including a mirror support secured in said housing;

said mirror support comprising a planar member having a circular aperture therein having a diameter less than said concave mirror; and

resilient adhesive means adhering the rear said concave mirror to said mirror support.

20. An aerial-image display in accordance with claim 18 wherein said resilient adhesive means is silicone cement.

20.5 An aerial-image display in accordance with claim 20 wherein said resilient adhesive means comprises a pair of bead on one each side of the areas of contact between the rear face of the said mirror and said mirror support.

21. Countertop height apparatus for producing an aerial-image of an object comprising:

a housing of substantially counter height having a top surface including a window therein;

support means within said housing for an object to be displayed as an aerial-image outside of said window;

means for illuminating said object;

a partially silvered planar beamsplitter positioned in the optical path of light rays from said illuminated object;

a focusing reflector positioned within said housing directed at said window and located at approximately a 45 degree angle with respect to said partially silvered beamsplitter;

whereby light rays from said object are partially reflected by said partially silvered beamsplitter toward said focusing reflector directly through said partially silvered beamsplitter and through said window to produce an aerial-image of said object outside of said housing; and

means for preventing an observer who is viewing said aerial-image from seeing reflected images from outside of said housing in said window;

wherein said housing being of substantially counter height and said window is in the top surface thereof, objects contained within said housing are displayed as an aerial-image in the region of the top of the housing window at countertop height.

22. Apparatus in accordance with claim 21 wherein said housing includes a top side, a bottom side, a front side, a rear side and two lateral sides wherein
said window constitutes at least a portion of the top side of said housing;
said focusing reflector is secured to the inner region of said rear side;
said object to be displayed is located in the region of the inner surface of said bottom side;
said illuminating means is located in said housing between said partially silvered beamsplitter outside of the optical path from said object and directed at said object.

23. Apparatus in accordance with claim 1 including an additional focusing reflector adjacent to the inner surface of said top wall and directed toward said partially silvered planar mirror whereby the aerial-image is produced from the reflection of both of said focusing reflectors.

24. Apparatus in accordance with claim 21 wherein said focusing reflector comprises a flexible metallized film extending adjacent to an inner wall of a side; and
fan means for producing an air pressure difference between the faces of said flexible metallized film thereby producing a concave shape facing said window and providing a focusing reflector.

25. Apparatus in accordance with claim 21

wherein said housing includes a top side, a bottom side, a front side, a rear side and two lateral sides wherein;

said window is in said front side;

said focusing reflector is secured to the inner region of said rear side;

said object to be displayed is located in the region of the inner surface of said bottom side;

said illuminating means is located in said housing between said partially silvered mirror outside of the optical path from said object and directed at said object; and

said polarizing filter means is located at said window.

26. Apparatus in accordance with claim 1 including an additional focusing reflector adjacent to the inner surface of said top wall and directed at approximately a 45° angle toward said partially silvered planar mirror whereby an enhanced brightness aerial-image is produced from the reflection of both of said focusing reflectors.

27. Apparatus in accordance with claim 21 wherein said focusing reflector is metallized molded plastic.

28. Apparatus in accordance with claim 21 wherein said housing being of substantially counter height and said window is in the top side thereof, and wherein said housing includes an internal wall therein extending between the actual location of the object to be displayed and the image displaying portion of said window to obscure viewing of the object through the window.

29. Apparatus in accordance with claim 21 wherein said partially silvered beamsplitter is positioned in said housing generally parallel to said window.

30. Apparatus in accordance with claim 21 wherein said window constitutes an apparent support for the aerial-image.

31. Apparatus for producing an aerial-image of an object comprising:
a housing including a window therein;
support means for an object to be displayed as an aerial-image outside of said window;

means for illuminating the object to be displayed;

video camera means directed toward the object to be displayed;

video display means coupled to said video for producing in said housing an image of the object;

a beamsplitter in said housing positioned at approximately 45 degrees with respect to said video display of the object;

said beamsplitter also positioned at approximately 45 degrees with respect to said window of said housing;

a focusing reflector in said housing directed at said beamsplitter for receiving a partly reflected image of said object from said video display and for reflecting the image of the object out of said window to form an aerial-image of the object outside of said housing.

32. Apparatus in accordance with claim 31 wherein said video camera and illuminating means and the object are located in a light sealed enclosure within said housing.

33. Apparatus in accordance with claim 31 including support means outside of said housing including a platform located in the region of the aerial display of the object whereby the aerial-image of the object displayed appears to rest on said platform.

34. An aerial-image display comprising:

a video camera for photographing a subject to be reproduced as an aerial-image;

a video display coupled to said video camera for displaying the subject as photographed by the video camera

a beamsplitter positioned at approximately a 45-degree angle with respect to said video display;

a focusing reflector positioned at approximately a 45 degree angle with respect to said beamsplitter to receive an image reflected by said beamsplitter and to reflect the received image through said beamsplitter to a focus where an aerial-image of the subject is displayed.

35. An aerial-image display in accordance with claim 34 wherein the subject is a human face and said display provides a remote aerial-image of the subject.

36. An aerial-image in accordance with claim 33 including a headless mannequin located below the focus of said focusing reflector whereby the aerial-image of a human face appears on said mannequin.

37. Apparatus for producing an aerial-image of an object comprising:
a housing including a window therein;
support means within said housing for an object to be displayed as an aerial-image outside of said window;
means for illuminating said object;
partially silvered planar mirror positioned in the optical path of light rays from said illuminated object;
said partially silvered mirror also positioned at approximately a 45-degree angle with respect to said window;
focusing reflector positioned within said housing directed at said window

and located at approximately a 45 degree angle with respect to said partially silvered mirror;

whereby light rays from said object are partially reflected by said partially silvered mirror toward said focusing reflector directly through said partially silvered mirror and through said window to produce an aerial-image of said object outside of said housing;

means located between said partially silvered mirror and said window for preventing an observer who is viewing said aerial-image from seeing reflected images from outside of said housing in said window; and

including an additional focusing reflector adjacent to the inner surface of said top wall and directed at approximately a 45° angle toward said partially silvered planar mirror whereby an enhanced brightness aerial-image is produced from the reflection of both of said focusing reflectors.

38. Apparatus in accordance with claim 37 wherein said focusing reflectors are metallized molded plastic.

39. Apparatus for producing an aerial-image of an object comprising:
a housing including a window therein;
support means within said housing for an object to be displayed as an aerial-image outside of said window;
means for illuminating said object;

partially silvered planar mirror positioned in the optical path of light rays from said illuminated object;

said partially silvered mirror also positioned at approximately a 45-degree angle with respect to said window;

focusing reflector positioned within said housing directed at said window and located at approximately a 45 degree angle with respect to said partially silvered mirror;

whereby light rays from said object are partially reflected by said partially silvered mirror toward said focusing reflector directly through said partially silvered mirror and through said window to produce an aerial-image of said object outside of said housing;

means located between said partially silvered mirror and said window for preventing an observer who is viewing said aerial-image from seeing reflected images from outside of said housing in said window; and

wherein said focusing reflector comprises a flexible metallized film extending adjacent to an inner wall of said housing; and

fan means for producing an air pressure difference between said flexible metallized film and said housing thereby producing a concave shape facing said window and providing a focusing reflector.

40. Apparatus for producing an aerial-image of an object comprising:

- a housing including a window therein;
- support means within said housing for an object to be displayed as an aerial-image outside of said window;
- means for illuminating said object;
- partially silvered planar mirror positioned in the optical path of light rays from said illuminated object;
- said partially silvered mirror also positioned at approximately a 45-degree angle with respect to said window;
- focusing reflector positioned within said housing directed at said window and located at approximately a 45 degree angle with respect to said partially silvered mirror;
- whereby light rays from said object are partially reflected by said partially silvered mirror toward said focusing reflector directly through said partially silvered mirror and through said window to produce an aerial-image of said object outside of said housing;
- means located between said partially silvered mirror and said window for preventing an observer who is viewing said aerial-image from seeing reflected images from outside of said housing in said window;
- wherein said reflecting means comprises a partial spherical concave mirror having a rear surface for support and a front reflective surface; and
- including a mirror support secured in said housing;

said mirror support comprising a planar member having a circular aperture therein having a diameter less than said concave mirror; and

resilient adhesive means adhering to the support surface of said concave mirror to said mirror support as a bead in contact between said concave mirror and the edge of said circular aperture.

41. Apparatus for producing an aerial-image of an object comprising:

a housing including a window therein;

support means with said housing for an object to be displayed as an aerial-image outside of said window;

means for illuminating said object;

partially silvered planar mirror positioned in the optical path of light rays from said illuminated object;

said partially silvered mirror also positioned at approximately a 45-degree angle with respect to said window;

focusing reflector positioned within said housing directed at said window and located at approximately a 45 degree angle with respect to said partially silvered mirror;

whereby light rays from said object are partially reflected by said partially silvered mirror toward said focusing reflector directly through said partially silvered mirror and through said window to produce an aerial-image of said object outside of said housing; and

means located between said partially silvered mirror and said window for preventing an observer who is viewing said aerial-image from seeing reflected images from outside of said housing in said window; and

wherein said housing is a clock enclosure and a clock including a display of time;

wherein said display of time constitutes the image source;

and wherein said focusing reflector comprises a metallized concave region of the interior of the wall of said housing opposite said window.

42. Apparatus in accordance with claim 21 wherein said preventing means comprises a polarizing filter.